

What is claimed is:

1. A delay jitter reducing device, comprising:

a receiving unit sequentially receiving chronological data segments through a network;

a time detecting unit for obtaining a reception time of each data segment received by said receiving unit;

transmission time estimating means for estimating
transmission time of each data segment received by said
receiving unit;

a delay time estimating unit for estimating a delay time required for transmitting each data segment based on said reception time and said transmission time of each data segment;

a minimum delay time estimating unit for estimating a minimum delay time in transmitting a data segment through the network from the estimated values of delay time of a plurality of data segments obtained from said delay time estimating unit;

relative delay time computing means for obtaining a relative delay time by subtracting said minimum delay time from the estimated value of delay time of a data segment estimated by said delay time estimating unit; and

delay means for obtaining an amount of holding time corresponding to each data segment by subtracting the relative delay time of each data segment from a maximum delay time to be reduced, and outputting each data segment after delaying each data segment for the amount of holding time corresponding to each data segment.

2. A delay jitter reducing device according to claim 1,

wherein said receiving unit receives a plurality of training data segments before receiving a data segment to which deference is to be applied; and

wherein said minimum delay estimating unit estimates said minimum delay time from estimated values of delay time for said plurality of training data segments.

3. A delay jitter reducing device according to claim 1,
wherein said minimum delay time estimating unit obtains
estimated values of delay time for a plurality of data segments
that are received in a certain period and estimates said minimum
5 delay time from these estimated values.

4. A delay jitter reducing device according to claim 3,
wherein said data segment is a data unit representing
voice.

10

5. A delay jitter reducing device according to claim 1,
wherein said receiving unit alternately receives a data
segment belonging to a first section that requires continuity
and a data segment belonging to a second section that does not
15 require continuity; and

wherein said minimum delay time estimating unit estimates,
at the point of receiving a first data segment belonging to the
first section, said minimum delay time for data segments that
have been received up to the time point.

20

6. A delay jitter reducing device according to claim 1,
wherein said delay time estimating unit estimates delay
time of said data segment based on transmission time information
or any clue information for transmission time accompanied by
25 said data segment and reception time thereof.

7. A delay jitter reducing method, comprising:
a receiving process sequentially receiving chronological
data segments through a network;

30

a time detecting process for obtaining a reception time
of each data segment received by a receiving unit;

a transmission time estimating process for estimating
transmission time of each data segment received by said
receiving unit;

35

a delay time estimating process for estimating delay time
required for transmitting each data segment based on said

reception time and said transmission time of each data segment;

5 a minimum delay time estimating process for estimating a minimum delay time in transmitting a data segment through the network from the estimated values of delay time of a plurality of data segments obtained from said delay time estimating unit;

a relative delay time computing process for obtaining a relative delay time by subtracting said minimum delay time from the estimated value of delay time of a data segment estimated by said delay time estimating unit; and

10 a delay process for obtaining an amount of holding time corresponding to each data segment by subtracting the relative delay time of each data segment from a maximum delay time to be reduced, and outputting each data segment after delaying each data segment for the amount of holding time corresponding to
15 each data segment.

8. A program for making a network-connected computer execute:
a receiving process sequentially receiving chronological data segments through the network;

20 a time detecting process for obtaining a reception time of each data segment received by a receiving unit;

a transmission time estimating process for estimating transmission time of each data segment received by said receiving unit;

25 a delay time estimating process for estimating delay time required for transmitting each data segment based on said reception time and said transmission time of each data segment;

a minimum delay time estimating process for estimating a minimum delay time in transmitting a data segment through the
30 network from the estimated values of delay time of a plurality of data segments obtained from a delay time estimating unit;

a relative delay time computing process for obtaining a relative delay time by subtracting said minimum delay time from the estimated value of delay time of a data segment estimated
35 by said delay time estimating unit; and

a delay process for obtaining an amount of holding time

2025 RELEASE UNDER E.O. 14176

corresponding to each data segment by subtracting the relative delay time of each data segment from a maximum delay time to be reduced, and outputting each data segment after delaying each data segment for the amount of holding time corresponding to each data segment.

9 . A computer-readable recording medium that has recorded a program for making a network-connected computer execute:

10 a receiving process sequentially receiving chronological data segments through the network;

a time detecting process for obtaining a reception time of each data segment received by a receiving unit;

15 a transmission time estimating process for estimating transmission time of each data segment received by said receiving unit;

a delay time estimating process for estimating delay time required for transmitting each data segment based on said reception time and said transmission time of each data segment;

20 a minimum delay time estimating process for estimating a minimum delay time in transmitting a data segment through the network from the estimated values of delay time of a plurality of data segments obtained from a delay time estimating unit;

25 a relative delay time computing process for obtaining a relative delay time by subtracting said minimum delay time from the estimated value of delay time of a data segment estimated by said delay time estimating unit; and

30 a delay process for obtaining an amount of holding time corresponding to each data segment by subtracting the relative delay time of each data segment from a maximum delay time to be reduced, and outputting each data segment after delaying each data segment for the amount of holding time corresponding to each data segment.